

HOW THE INVESTMENT SUPPORT MEASURES IMPACT ON THE ECONOMIC STATE OF FARMS?

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ABSTRACT

The farms sustainable development is determined to a big degree by their investment activity. In the first investment period (2007-2013), as well as in the present period of CAP special attention has been paid to measures encouraging structural investments. One of these measures targets is the increase of farmers' economic potential. Generally, the investment support covers a part of total costs necessary for realizing of different by their duration programs (single, short-term, medium-term and long-term), related to the investment activity in a farm (Dwyer, 2005). Investment subsidies are often related to the criteria, subordinated to environment protection and farms economic sustainability. This paper aim is to present the results of ex-post and ex-ante analysis of investment support measures impact of farms economic state, in relation their investment activity.

Key words: agricultural investments, investment subsidies, net income, gross output, costs.

INTRODUCTION

Investment support covers in general a part of integral costs, necessary for the realization of programs with different duration (single, short-term, medium-term and long-term), related to the investment activity in a definite farm (Dwyer, 2005). Investment subsidies are often related to the criteria, subordinated to environment protection and farms economic sustainability. As a result of made investments, there is an expectation for improvement of the productivity in agriculture and in particular, of different farmers (Dwyer, 2005).

In Europe, the investment support for farms have been a priority after the Rome Treaty in 1957. One of the aims in this treaty is to increase agricultural productivity through supporting of the technical progress and increase of labour productivity. In 1972 the plan Mansholt led to the elaboration of European Regulation for farms modernization. Thereafter, EU Regulations 2328/91 and 950/97 have been successively introduced for the improvement of efficiency and competitiveness of agricultural production and for maintaining of European production on the world market. Since 2000 the support of farms modernization is included in the Second CAP pillar. Member-states could include the farms investment support in pillar 1 of their rural development plans for the implementation of Regulations 1257/1999 and 1698/2005. The most direct expression of the investment support policy in the light of CAP in the period 2007-2013 have been the following measures: Measure 121 for farms modernization; Measure 112 for young farmers' start-up and the support for investments related to the diversification of non-agricultural activities (Measure 311). The different types of investment support can be classified in five groups: structural investments (Measure 121); investments improving the environment quality (or decreasing the negative exterior factors) (Measure 121); investments improving the animal welfare (Measure 121); investments stimulating the diversification (Measures 121 or 311); investments related to the taking over the cost of setting up farms by young farmers (Measure 112). Diversified investments are all kinds of investments leading to formation of farm's income from non-primary agricultural activities (Measure 121) or non-

agricultural activities (Measure 311). Ecological investments are composed by investments diminishing the risks for the environment, for instance, technics for decreasing of emissions in animal buildings and manure spreading, technics for decreased consumption of energy, fertilization and water use. Investments in animal welfare suppose the implementation of alternative systems for the animal buildings and the living conditions in these buildings.

In the present program period 2014-2020 the Measure 4.1 „Investments in farms“ is in force, as a part of RDP 2014-2020 and the maximal budget of a project is 1,5 millions EUR. Investments include building, reparations and creation of plantations. It is envisaged that all investments in North-West Bulgaria will benefit in priority, as well as investments in livestock, perennial crops, vegetable production and those for young farmers who are beneficiaries under the measure from the previous program period. There is a concluded contract with the World Bank from 2014 for the elaboration of Strategy for hydro-meliorations development. The other RDP Measures in the period 2014-2020, related to supporting of investment activity are: Measure 6.1 „Support for start-ups of young farmers“ and Measure 4.2. „Investments in processing/marketing of agricultural products“.

METHOD AND DATA

For the elaboration of qualitative assessment of the investment support impact on the farms economic state, as a measure of RDP in the period 2007-2013, the method of economic modeling has been used (Nickell, 1981; Dwyer, 2005; Upite, 2009; Buchta & Buchta, 2009).

The econometric analysis of the investment support impact is based on the following general appearance of the model (Buysse et al., 2011):

$$Y_{nt} = \beta_0 + \beta_1 Y_{n(2007-2013)} + \beta_2 in_{(2007-2013)} + \beta_3 sn_{(2007-2013)} + \varepsilon_{nt} \quad (1)$$

where:

The dependent variable “ Y_{nt} ” represents the following three indicators: "gross output", "total costs" and "net income of farms". Three econometric models will be assessed, corresponding to the three different dependent variables: "n" is the index of the farm, and "t" is the index of the year. “ Y_{nt} ” represents the dependent variable magnitudes, which are the result of agricultural activity, the costs and the revenues at the different assessments, $Y_{n(2007-2013)}$ is the value of the dependent variable for the period 2007-2013, $in_{(2007-2013)}$ is the farms investments amount for the period 2007-2013, $sn_{(2007-2012)}$ is the investment support amount in n-th farm for the period 2007-2013, β_0 is a free member, β_0 , β_1 , β_2 , β_3 , are the evaluated coefficients of investments and investment support impact on the dependent variable “ Y_{nt} ”.

For the building of the econometric model(s) have been used FADN data covering the period from 2007 to 2013. The reported data for the investment support is not differentiated in relation to which source the subsidy was received and according to which RDP Measure. This fact imposes to achieve the quantitative assessment of investment support impact not in integrity but according the different measures. The research logic has imposed the transformation of the primary basic data per years in the so-called parallel data, i.e. the research sample includes only these farms that had been objects of survey in every year of the period 2007-2013.

RESULTS AND DISCUSSION

Ex-post analysis of the results of the econometric model

- **The dependent variable (Y_{Go}) represents the value of gross output in 2013.**

The following two indicators impacting on the gross output amount are used as independent variables:

- I.V. (2007-2013) - investments value in all the overall period 2007-2012 (BGN);

- I.S. (2007-2013) - investments support value in the overall period 2007-2013 (BGN);
The obtained results of the completed regression analysis are shown in Table 1.

Table 1. Characteristics of the regression model with the dependent variable „Gross Output”

	Regression coefficients	Correlation coefficient R 0,709	Standard error	t-value	F- empiric value 287,730	Level of significance
Constant value	266613,57	X	71137,484	3,748	X	0,000
I.V. (2007-2013)	0,742	X	0,035	21,098	X	0,000
I.S. (2007-2013)	1,190	0,672	1,771	0,037	X	X

Source: SPSS with FADN data

The data analysis in the last two tables proved the existence of a statistically significant determination of the generated GO in 2013 both from the investments made and the investment support received during the whole period under review. The built regression model is adequate (high value of F according the Fisher criterion, significance level equal to zero). From the calculated correlation coefficient (0.709) it is clear that this dependence is strong. According to the obtained regression coefficients, with an average increase of BGN 1,000 of investments during the period 2007-2013, the average increase in GO in 2013 is by 742. Analogically, with an increase of the investment support by 1000 BGN in the same period, the GO value increased by 1190 BGN. The made conclusions have a warranty probability of 95%, which corresponds to the confidence intervals.

- **The dependent variable (Y_{NI}) represents the generated farm net income in 2013.**

The independent variables are the same as in the previous case. For this reason, they are not described again, but the obtained results are presented directly in Table 2.

Table 2. Characteristics of the regression model with the dependent variable „Net income”

	Regression coefficients	Correlation coefficient R 0,414	Standard error	t-value	F- empiric value 58,855	Level of significance
Constant value	53842,804	X	16370,701	3,289	X	0,000
I.V. (2007-2013)	0,070	X	0,008	8,608	X	0,000
I.S. (2007-2013)	0,386	X	0,155	2,498	X	X

Source: SPSS with FADN data

The regression model in this case also is statistically significant for both analyzed factors. The comparative analysis of both models (for the Gross Output and for the Net Income) shows some similarities and differences. The positive effect of investments and of investment support exists also on the generated net income. Unlike the strong correlation dependence for the gross output, the relationship between the net income in 2013 on the one hand, and on the other hand, the investment and the investment support throughout the whole period, is moderate. The economic interpretation of the regression coefficients is that each increase of investments by 1000 BGN has been followed by the respective increase of the net income of 70 BGN. Also, the net income amount has an average increase of 386 BGN at an increase of investment support by 1000 BGN.

- **The dependent variable (Y_{OP}) expresses the total costs value in 2013.**

In this case the impact of the same two factors has been examined on the total costs level. The obtained statistical results are given in Table 3.

Table 3. Characteristics of the regression model with the dependent variable „Total costs”

	Regression coefficients	Correlation coefficient R 0,694	Standard error	t-value	F- empiric value 263,829	Level of significance
Constant value	249078,88	X	65551,258	3,800	X	0,000
I.V. (2007-2013)	0,070	X	0,032	19,855	X	0,000
I.S. (2007-2013)	0,386	X	0,619	2,403	X	X

Source: SPSS with FADN data

In the last model the statistical dependence between the total costs level and the independent variables “investments” and “investment support” for the period 2007-2013 falls in the category of strong relation. The impact on the total costs has positive character. Their increase is in the limits of 643 BGN and 1488 BGN at a respective increase of made investments and investments subsidies both by 1000 BGN in the whole analyzed period.

From the made ex-post analysis of investments impact in the period 2007-2013 on farms’ economic results, the following conclusions could be made:

- The made investments and the received investment support in the overall period 2007-2013 have had a significant impact on the generated in farms in 2013 three economic indicators: gross output, net income and total costs.
- Obviously, the demanded impact of the investment support could be determined under the condition that the total amount of investment subsidies is taken into account for all the period rather than per separate years. The impossibility to define their impact for each different year was proved on the first stage of the made analysis.
- The degree of the established statistical relation is strong at for the generated gross output and total costs and moderate for the net income formation.
- Despite the noticed differences, the direction of influence of the investment amount and the investment support is positive in the generation of all three economic indicators.

Ex-ante analysis of investment support impact in 2014-2020 on farms economic state

The results of the made comparative analysis between the investments made over the period 2007-2013 and the planned ones for the period 2014-2020, per types, are presented in Fig. 1.

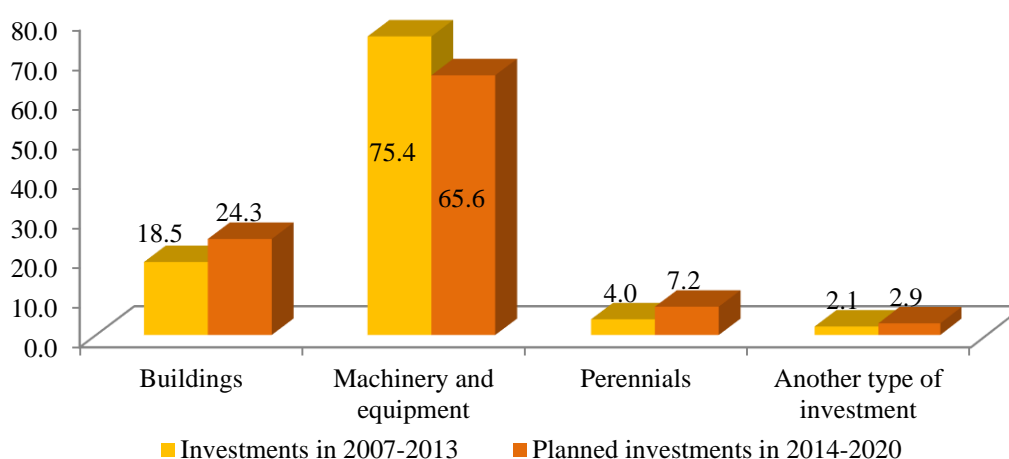


Figure 1. Relative share of made and planned investments, according their types (%)

Source: Own calculations with data from a survey research

In the present program period the farmers’ intentions are oriented toward bigger investments in farm buildings and perennial crops in comparison to the previous period. And vice versa, the interest in investment in machinery and equipment has decreased by

approximately 10 %. One of the probable reasons for this result is the activity of new machinery and technics implementation during the past period and in some degree, the need of them was satisfied. Nevertheless, the intentions of farmers are still tightly related to the investments namely in machinery and equipment.

The analysis of the effect of the expected investment support in 2014-2020 on the farms' economic state is led on the base of the obtained results from the econometric models.

- **Farms with economic size from 2000 to 8000 EUR**

The obtained results, related to the determination of the expected investment support impact in 2014-2020 on small farms are shown in Table 4.

Table 4. Net income dynamics, on average, per farm with economic size from 2000 to 8000 EUR in the period 2014-2020 compared to 2013 with the impact of the expected investment support under the different CAP and RDP measures (%)

Measure and sub-measure	Relative share of financial support against eligible costs (%)	Net income increase in 2014-2020 as a result of the expected financial support –BGN		Net income per farm in 2013 - BGN	Dynamics of the net income, compared to 2013 under the investment support impact (%)	
		Min.	Max.		Min.	Max.
M.4.1.2	60	28	556	1679	1.66	33.10
	80	37	741	1679	2.21	44.13
M.6.3.	100	x	556	1679	x	33.10
M.6.4.2.	85	157	2204	1679	9.38	131.30

Source: Own calculations

The analysis of data above shows that the expected investment support has the biggest impact on the net income under Measure 6.4.2. The net income will increase on average at least by 9,4% and the most by 131,3% in this group of farms, compared to the basic 2013. This will happen in case that farms will receive a financial support under this measure for the whole program period. In 2015-2016 the scientific team of the present project with the collaboration of the National Agricultural Advisory Service led a survey on attitudes and activity of farmers to investment Measures in the new programming period. The results of this research have shown a low activity degree of farmers under this measure (Fig. 2) From the interviewed small farmers, barely 11,2% are firmly resolved to make investments in non-agricultural activities, using the support from M.6.4.2. Thus, the positive impact of this measure will affect one of ten farms in the group with small economic potential. This result is indicative for the still unconscious need of diversification of economic activities as a reliable tool for their economic stability raising.

The most attractive measure among small farms in the present program period is the investment measure 6.3. „Start-up support for the development of small farms”. The financial support under this measure is 100% and this is probably one of the reasons for the reinforced interest. 47 % of interviewed small farmers have the firm conviction to try to benefit of this measure opportunities (Fig. 2).

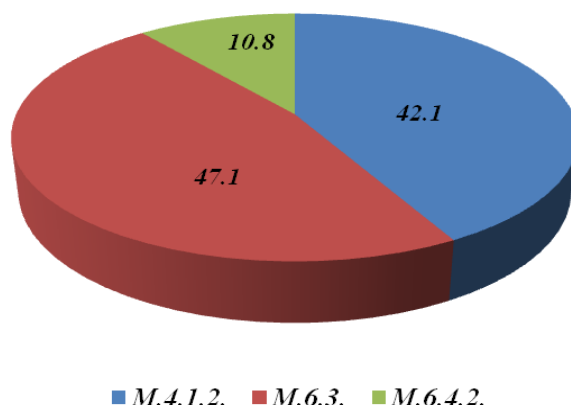


Figure 2. Structure of attitudes of small farms towards the available investment measures (%)
Source: Own calculations

As we can see above, the small farms have sufficient motivation to apply not only for M.6.3., but for M.4.1.2.” Investments in farms under Thematic sub-program for small farms development”. Their range amounts 42%. The little less interest in this Measure in relation to M.6.3. is due to the partial financial support, amounting 60% (max.80%) of the total amount of eligible costs, instead of 100%.

Future investments in farms under the Thematic program for small farms development (Measure 4.1.2.) will contribute for the net income increase, on average in one MEC by at least 1.7% and at most by 33%, compared to 2012, provided that 60% of the costs eligible for investment will be covered by this measure. In the case of increasing of the financial support up to the maximal threshold of 80%, the net income will grow in the interval from 2,2% to 44,1%. Agricultural producers manifest significantly bigger interest in this thematic program. The relative share of these farmers, declared their intention to apply for this program is 36,2%. It is obvious that the importance of investments in tangible and intangible fixed assets, leading to improved economic sustainability and farm performance, is recognized as a real need for more and more small farmers.

High degree of positive impact on the net income dynamics has the investment measure 6.3. „Start-up support for small farms development”, because the financial support under this measure is 100% and the net income of the candidates approved by the measure would increase by 33.1% compared to 2012. This measure is the most attractive investment measure among the small farmers in the second program period. The percentage of interviewed small farmers, which will apply for this measure opportunities is 40%. The obtained results, related to the comparative analysis of the expected impact of different investment measures and sub-measures for the smallest farms could be seen on Fig. 3.

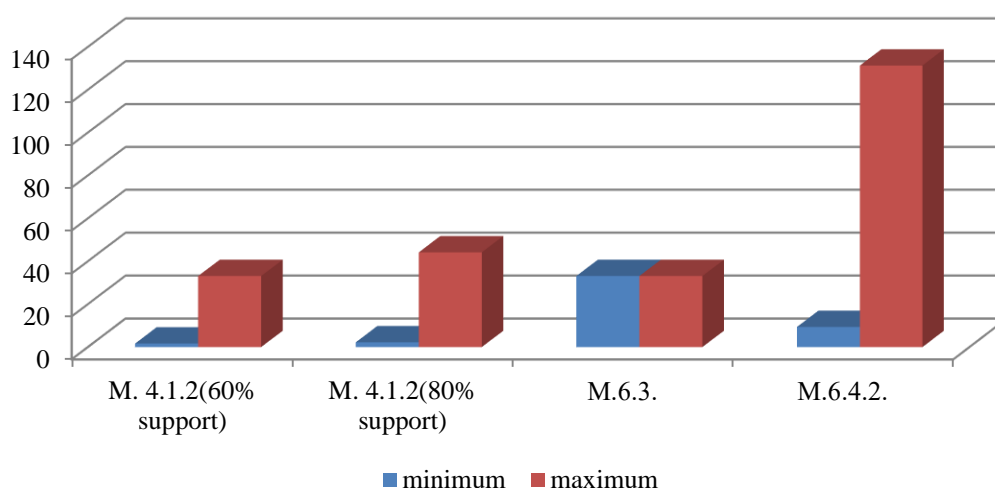


Figure 3. Expected net income increase on average, per farm with economic size from 2000 to 8000 EUR in the period 2014-2020, compared to 2013, under the influence of different investment measures (%)

Source: Own calculations

• Farms with economic size over 8000 EUR

As it was determined, for the medium- and large-size farms there is a statistical sustainability of regression models for the three economic indicators: gross output, net income and total costs. Having in view the considerably lower correlation coefficient between the net income and the investment subsidies ($R=0,4$), in comparison to the correlation coefficients between the investment support and the gross output ($R=0,7$), respectively between the investment subsidies and the total costs ($R=0,68$), the expected impact of the investment support is considered separately only on these two indicators. The obtained results are given successively in Table 5.

Table 5. Dynamics of the gross output on average, per farm with economic size from 2000 to 8000 EUR in the period 2014-2020, compared to 2013, under the influence of the expected investment support under CAP and RDP measures (%)

Measure and sub-measure	Relative share of financial support against eligible costs (%)	Net income increase in 2014-2020 as a result of the expected financial support –BGN		Net income per farm in 2013 - BGN	Dynamics of the net income, compared to 2013 under the investment support impact (%)	
		Min.	Max.		Min.	Max.
M.4.1.	50	16819	1681875	1080392	2	156
M.4.2.	50	16819	3363750	1080392	2	311
M.4.4.	100	22425	22425	1080392	2	21
M.6.1.	100	56062	56062	1080392	5	5
M.6.2.	100	56062	56062	1080392	5	5
M.6.4.1.	75	16819	1009125	1080392	2	93
M.4.1.	50	16819	1681875	1080392	2	156

Source: Own calculations

The percentage increase in gross output up to the end of 2014-2020, compared to 2013, under the influence of the expected investment subsidies under the individual measures can be seen in Figure 4. It is in the range from 2% for M.4.1., M.4.2., M.4.4. and M.6.4.1. to 5% for M.6.1. and M.6.2.

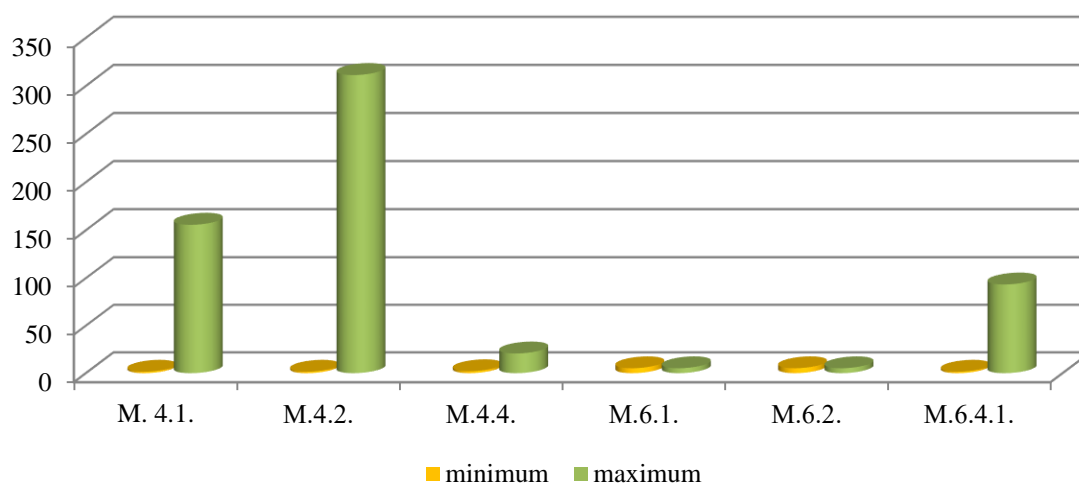


Figure 4. Expected gross output increase on average, per farm with economic size from 2000 to 8000 EUR in the period 2014-2020, compared to 2013, under the influence of different investment measures (%)
Source: Own calculations

The analysis of the above data shows the essential differences between the different measures on the gross output level at the upper limit of the expected investment support. In this regard, the following measures are strongly emphasized: M.4.2, which is aimed at modernization of the physical assets of enterprises processing agricultural products, in order to produce new and quality products, including those related to short supply chains; M.4.1., which will support investments related to the main activity and farm modernization and M.6.4.1. destined for investment support in non-agricultural activities. The maximal possible increase in gross output, as a result of the three measures listed, is more than 3 times, respectively, to support investments in processing agricultural enterprises; 1.6 times for investment support for farm modernization and by 93% (or 0,93 times) as a result of potential financial support for investments, related to development of tourism, services in all sectors (for example: care for children and elderly people, people with disabilities, health services, accounting and auditing services, veterinary services and services based on IT), etc.

The expected high increase of gross output level is due to the big size of the maximal eligible investment costs and respectively, to the expected investment support. It should be noticed that the beneficiaries of the maximal investment support will be the biggest individual financially stable farms or different organizations of agricultural producers. Moreover, they should comply with all general acceptance conditions and a number of other specific requirements. Taking in consideration these considerations, it can be assumed that the group of beneficiaries who will receive the maximum possible amount of investment support will not be numerous.

The investment support amount for the bigger part of the farmers will be under the maximal value. It is more probable that its amount will be close to the minimal value or barely over the minimal threshold. The bigger part of the beneficiaries will be oriented namely to this investment support value.

In the next Table 6 are given the results for the expected changes of the total costs levels, on average, per farm with economic potential over 8000 EUR, under the impact of the future investment support.

Table 6. Total costs dynamics on average, per farm with economic size over 8000 EUR in the period 2014-2020, compared to 2013, under the impact of the expected investment support under different CAP and RDP measures (%)

Measure and sub-measure	Relative share of financial support against eligible costs (%)	Net income increase in 2014-2020 as a result of the expected financial support –BGN		Net income per farm in 2013 - BGN	Dynamics of the net income, compared to 2013 under the investment support impact (%)	
		Min.	Max.		Min.	Max.
M.4.1.	50	21206	2120625	971368	2	218
M.4.2.	50	21206	4241250	971368	2	437
M.4.4.	100	28275	282750	971368	3	29
M.6.1.	100	70688	70688	971368	7	7
M.6.2.	100	70688	70688	971368	7	7
M.6.4.1.	75	21206	1272375	971368	2	131
M.4.1.	50	21206	2120625	971368	2	218

Source: Own calculations

The presented increase of the total costs up to the end of the period 2014-2020, compared to 2012 under the impact of the expected investment subsidies, under different measures, could be seen of Fig.5.

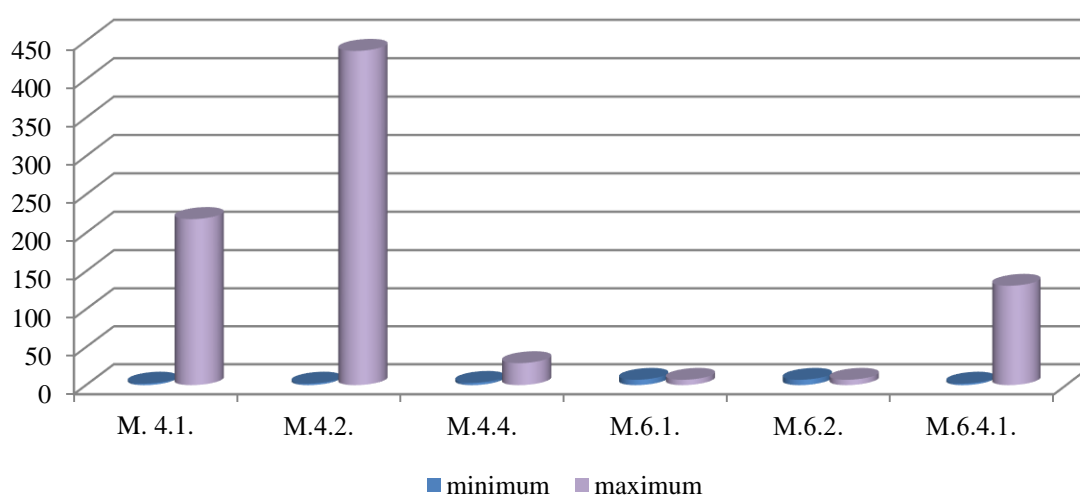


Figure 5. Expected total costs increase on average, per farm with economic size over 8000 EUR in the period 2014-2020, compared to 2013, under the impact of different investment measures (%)

Source: Own calculations

We can see the similarities between the last two graphs. The degree of expected impact of investment support under the different measures is almost the same on both economic indicators: gross production and total costs. This conclusion is valid in relation to the minimal support for the farms of the analyzed group, as well as from the point of view of the maximal eligible investment support.

The expected scope of farms with economic size over 8 000 EUR in different programs for investment support in 2014-2020 is presented on Fig. 6.

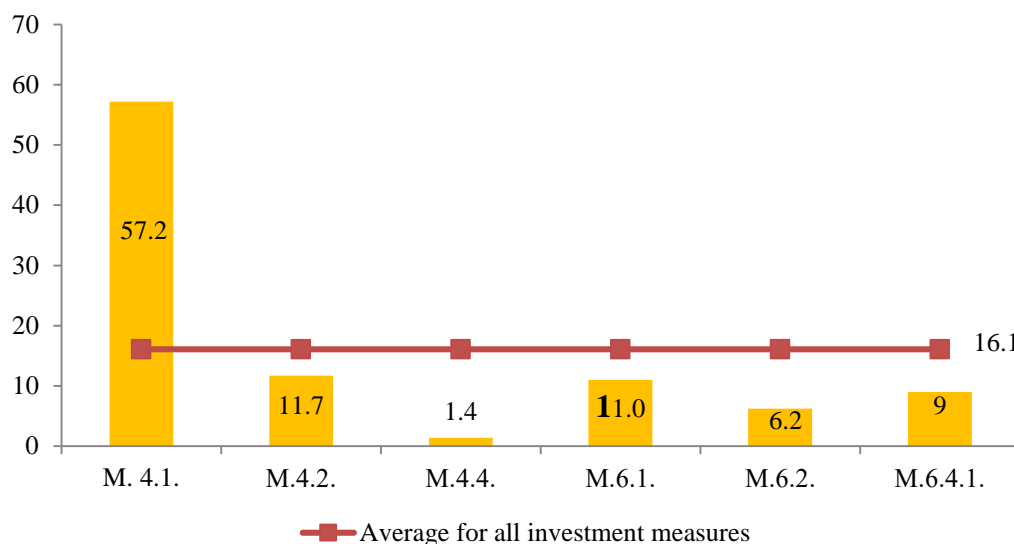


Figure 6. Expected range of farms with an economic size over 8000 EUR under different investment measures in the period 2014-2020 (%)

Source: Own calculations

At the last graph analysis stands up the much bigger interest in the investment measure for farms' modernization, compared to other measures for investment support (M.4.1.). Practically, almost 60% of farmers, which holdings have an economic potential over 8000 EUR, or every second farmer has profited from M.4.1. The average farms' range for all investments measures amounts 16%, and it is the lowest for the measures, related to non-agricultural and non-productive activities (M.4.4 and M.6.2.). Relatively low (under 10%) is the share of farms, which would apply for Measure M.6.4.1., which also is destined for investments supporting non-agricultural activities. Provided that the farms are not oriented to non-agricultural investments, the process of their activities diversification will run slowly and uncertainly in the present period also.

CONCLUSIONS

From the made ex-ante analysis of the expected impact of investment measures on farms economic performance the following conclusions can be drawn:

- The effect of all investment measures implementation for the different farms groups is expected to be positive;
- The most attractive is the investment measure aiming a start-up support for development of small farms (M.6.3.).
- The investment measure M.4.1.2. is also sufficiently attractive and the expected maximal effect of it on the net income increase is within 30-40%.
- The degree of expected investment support impact of different measures for farms with size above 8000 EUR is almost the same on the gross output and the total costs.
- The strongest potential effect on economic indicators will have the measures oriented toward the farms modernization.
- The expected increase of the gross output and the total costs, as a result of the receiving of the maximal investment support is almost the same for all investment measures.
- The pace of increase of total costs under the impact of different investment measures will be higher in comparison to the pace of increase of the gross output.

- The expected range of farms with economic size over 8000 EUR, which will receive an investment support is very different under the different programs for investment support.
- The predominant part of this group of farms will be the most active in relation to the investment measure for investments in the main activity of the farm.
- Relatively low is the interest manifested in measures encouraging the investments in non-agricultural activities.

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